

10/571400

IAP20 Rec'd PCT/PCT 09 MAR 2006

**Housing for glass-fiber plug connectors, and a method  
for laying glass-fiber cables**

5 The invention relates to a housing for glass-fiber plug connectors and to a method for laying glass-fiber cables which can be fabricated with glass-fiber plug connectors.

It is known for glass-fiber cables to be fitted with plug connectors at one end (pigtail) or at both ends (patchcord). Glass-fiber cables can be connected quickly and such that 10 they can be detached safely and reliably by means of plug connectors. Owing to their size, glass-fiber cables and/or conductors fitted with plug connectors, cannot, however, be laid without problems in all applications. It is known for a glass-fiber conductor and/or a glass-fiber cable to be laid first of all without any plug connectors. The laid glass-fiber cable is spliced at at least one free end to a glass-fiber cable (pigtail) which 15 is prefabricated with a plug connector. The splicing of glass-fiber cables involves work which takes a long time and, in some case, is also possible only at special workstations.

The invention is thus based on the technical problem of providing an improved glass-fiber plug connector and an improved method for laying glass-fiber cables which can be 20 fitted with glass-fiber plug connectors.

For this purpose, a housing for a glass-fiber plug connector is formed in two parts, in which at least one housing part has an opening, and the housing part can be latched 25 over a conductor cable through an opening in the transverse direction. If the glass-fiber cable or the glass-fiber conductor is prefabricated without a housing for a plug connection, then the diameter of the prefabricated conductor cable is only insignificantly greater than the diameter of the free ends. The conductor cable can thus be laid without any problems for virtually all applications. If the conductor cable is 30 prefabricated, then at least one housing part cannot be latched onto the conductor cable in the longitudinal direction, that is to say from the end of the laid conductor cable. The opening allows the housing part to be mounted on the laid, prefabricated conductor cable in a transverse direction, that is to say at an angle that is not equal to 0° with respect to the longitudinal direction. The mounting process is preferably 35 carried out at a plug-in location. The conductor cable may in this case be prefabricated for a plug connector at only one end. It is possible for the second end to already be fitted with a plug connector. For laying the conductor cable, it is often sufficient for one

end not to be fitted with a plug connector. However, it is also just as feasible for the second end to be free. The free end is, for example, suitable for splicing to racks and/or housings.

- 5 In a further embodiment, the conductor cable is prefabricated with a ferrule. In a plug connection for glass-fiber cables, the ends to be connected touch on end surfaces of the ferrules. The fitting of a ferrule to the conductor cable requires high precision. The conductor cable is thus preferably prefabricated with the ferrule. In order to lay the conductor cable, the ferrule can be protected by a suitable apparatus, for example a  
10 cap.

In a further embodiment, a compression spring can be prestressed by means of the housing, in which case the position of the ferrule and of the conductor cable in the housing can be secured by means of the compression spring. The compression spring

- 15 is preferably mounted in advance on the conductor cable.

In a further preferred embodiment, the housing parts are latched. Latching connections allow precise, secure and direct connection of components.

- 20 In a further preferred embodiment, the housing has a plug housing and a closure cap, in which case the closure cap can be connected to the plug housing in the longitudinal direction of the conductor and the closure cap has a slot for latching onto the conductor cable. Conductor cables which are fitted with plug connectors have, for example, a secondary coating, and have a diameter of 0.9 mm. The slot may be very narrow for an  
25 embodiment of the conductor cable such as this. However, glass-fiber cables with different diameters, for example 2.4 mm or 3 mm, are also known. The slot must therefore be designed appropriately for the application. The connection of the closure cap to the plug housing in the longitudinal direction of the conductor cable means that the compression spring in the connection can be prestressed. This allows particularly  
30 simple handling. However, it is also feasible for the housing to have two housing shells in which the conductor cable is embedded.

In a further preferred embodiment, the closure cap has two latching tabs, and the plug housing has latching eyes which are complementary to them. The arrangement of

- 35 latching tabs and latching eyes is preferably chosen so as to avoid undercuts, so that the parts can be produced at low cost, for example as die-cast or extrusion-molded parts.

In a further preferred embodiment, the closure cap has a flange. The flange is used as a contact surface for the connection of the closure cap to the plug housing.

5 In one preferred embodiment, the housing is in the form of an LC, FC, MTRJ, E2000, SC, Duplex-SC, ST or DIN plug. Detachable connections are required for many reasons within a glass-fiber network, for example in order to allow switching and/or simple access for measurements. The plug connector must be chosen appropriately, depending on the application and/or field of use.

10

The invention will be explained in more detail in the following text with reference to a preferred exemplary embodiment. In the figures:

15

Fig. 1: shows a schematic illustration of an unmounted plug connector, and

Fig. 2: shows a section through a mounted plug connector.

Figure 1 shows, schematically, an unmounted plug connector having a plug housing 10, a closure cap 12 and a prefabricated conductor cable 2. The prefabricated conductor cable 2 has a ferrule 20, a ferrule flange 22, a compression spring 24 and a conductor 26. The plug housing 10 has an opening 100 for the ferrule 20. The connection to a further glass-fiber cable is made via the end surface 220 of the ferrule 20.

20 The prefabricated conductor cable 2 is laid at its point of use. By way of example, the conductor 26 has a secondary coating, and has a diameter of approximately 0.9 mm. Owing to the prefabrication, the diameter of the conductor cable 2 at the illustrated end is only slightly greater than the diameter of the conductor 26. The prefabrication therefore restricts the laying of the conductor cable 2 only to an insignificant extent.

25 The conductor cable 2 is positioned in the plug housing 10, with the ferrule flange 22 resting on a contact surface, which cannot be seen, in the plug housing. The position of the conductor cable 2 in the plug housing 10 is secured by means of the closure cap 12 and the compression spring 24. The closure cap 12 is latched onto the plug housing 10 in the longitudinal direction of the conductor. For this purpose, the closure cap 12 has 30 two latching tabs 122, and the plug housing 10 has latching eyes 102 which are complementary to them. In the illustrated view, only one latching tab 122 and one

latching eye 102 can be seen. The second latching pair is arranged symmetrically with respect to the center axis thereof.

The internal diameter of the closure cap 12 is, at least in places, less than the external  
5 diameter of the conductor cable 2 on the ferrule flange 22 and/or the compression  
spring 24. The closure cap 12 can in consequence not be plugged onto the conductor  
cable 2 via a prefabricated end in the longitudinal direction. According to the invention,  
the closure cap 12 has a slot 120. The slot 120 is in this case preferably formed over  
10 the entire length of the closure cap 12. The slot 120 allows the closure cap 12 to be  
latched to the laid prefabricated conductor cable 2 in a transverse direction at the plug-  
in location.

Figure 2 show, schematically, a section through a mounted plug connector, comprising  
the plug housing 10, the closure cap 12 and the prefabricated conductor cable 2. The  
15 ferrule 20 is connected to the conductor 26 via the ferrule flange 22. One end surface  
220 of the ferrule flange 22 rests on a contact surface 104 on the plug housing 10. The  
compression spring 24 is prestressed by latching the closure cap 12 onto the plug  
housing 10. The position of the conductor cable 2 is thus secured by means of the  
compression spring 24 and the closure cap 12.

20 The illustrated plug housing 10 is in the form of an LC plug housing. LC plug  
connectors are used, for example, for telecommunication applications, LAN in-house  
networks, cable television, fiber to the home, and/or fiber to the desk. Typical cable  
configurations for LC plug connectors are, for example, a 0.9 mm conductor, a 1.8 mm  
25 cable or a duplex cable. The ferrule 20 of an LC plug connection is in the form of an  
SFF (small form factor) ferrule with a diameter of 1.25 mm. Owing to the small  
dimensions of the illustrated LC plug connection, LC plug connections can be used in a  
versatile manner and flexibly. However, the invention is not restricted to LC plug  
connections.

30

**List of reference symbols**

5	2	Conductor cable
	10	Plug housing
	12	Closure cap
	20	Ferrule
	22	Ferrule flange
10	24	Compression spring
	26	Conductor
	100	Opening
	102	Post eye
	120	Slot
15	122	Latching tab
	220	End surface

20

25

30

35